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Map Turtles (Genus *Graptemys*) in the Hurricane Belt of the Gulf Coast

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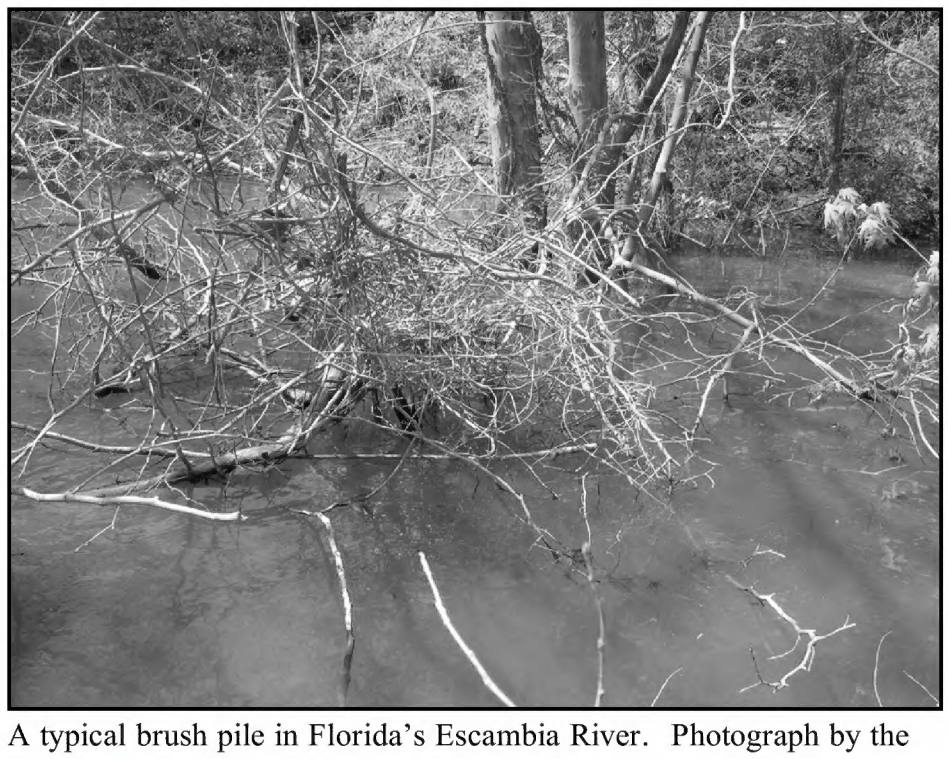
From a human perspective, hurricanes are natural disasters: negative effects include loss of individual lives, property and in some cases livelihoods. But even though it is hard to look at a hurricane as a "good thing" when considering people, there may be some beneficial effects to the environment. The natural ecosystems in the Hurricane Belt are adapted to this kind of stress. The physical environment may sustain considerable damage, but the plants and animals have been through hurricanes many times before and are adapted for survival. The map turtles (genus *Graptemys*) of the southeastern United States certainly exemplify this. Here I report on several post-hurricane effects I observed on *Graptemys* species and their habitat during a spring 2005 trip to the Gulf Coast.

A positive effect of hurricane Ivan (16 September 2004 landfall over Mobile, Alabama) was the large amount of habitat created in rivers by falling tree debris. Branches, and in some cases entire trees, which fell into the water ended up as brush piles or snags. Brush piles are very important to *Graptemys* because they provide shelter from predators, basking sites and areas to feed (Cagle, 1952; Ernst et al., 1994; Lindeman, 1997, 1998). *Graptemys* generally stay in close proximity to such areas (Carr and Marchand, 1942; Jones, 1996). These piles also help to prevent shoreline erosion, give shelter and shade to fish, and create unique river habitats for other organisms by either slowing down the flow of water or causing riffles.

Brush piles are a dynamic system in these fast-moving Gulf Coast rivers. They may break apart or come loose, in which case the current moves them downstream. They usually get caught in other brush piles or in sharp bends of the river. Over time they slowly break down and/or end up in the Gulf of Mexico. Some people who live along these rivers remove brush piles for better boat access. This, of course, is a disadvantage to basking riverine turtles.



A typical brush pile in Florida's Escambia River. Photograph by the author.

Over the past 14 years, I have noticed differences in the quantity and quality of brush piles in certain locations. When there is a long gap between hurricanes, tropical storms or severe storms, the brush piles thin out. This forces the turtles to become more concentrated in the remaining piles. In the aftermath of a hurricane, turtles are able to spread out because of more suitable habitat.

Nesting and egg incubation are also affected by hurricanes. The Gulf Coast *Graptemys* mostly nest on large sandy beaches along the river corridor. The adult females generally lay eggs from the beginning of June until August (Shealy, 1976). These females do not always lay their eggs high enough on the beach to be safe from flooding. It is not uncommon for many nests to be lost from long-lasting flood events. I found this to be the case in spring of 2005 with the Escambia map turtle (*G. ernsti*) on the Escambia and Conecuh rivers and the Barbour's map turtle (*G. barbouri*) on the Chipola and Apalachicola rivers, at least in southern part of their range. My monitoring sites near the landfall and path of hurricane Ivan yielded no sightings of hatchling *Graptemys* in the spring of 2005. In recent years, these areas have always had moderate to high numbers of neonates, even during some moderate flood events. However, adults were still present, even though the river was high over the banks and the nearby forested areas were totally inundated.

Map turtles are able to survive as species because of the long life of the adults. It takes the Gulf Coast female *Graptemys* a long time (approximately 8 to 20 years) to reach sexual maturity. Once mature, however, they can lay multiple clutches of eggs per season and reproduce very late in life (Sanderson, 1974). Hatchlings have relatively low survivorship, mostly due to predation. If a year or two of production is lost due to flooded nests, the population will still be sustainable assuming that the adult population survived the event.

Also in spring 2005 we monitored map turtle populations on the Pearl and Pascagoula Rivers in Mississippi, and the Tallapoosa, Tensaw and Coosa Rivers in Alabama. In these river systems the ringed map turtle (*G. oculifera*), yellow-blotched map turtle (*G. flavimaculata*), Pascagoula map turtle (*G. gibbonsi*), black-knobbed map turtle (*G. n. nigrinoda*), delta map turtle (*G. n. delticola*) and the Alabama map turtle (*G. pulchra*) appeared to experience very similar situations and outcomes. All of these rivers flooded and most of them were almost inaccessible. Hatchlings of all the above species were seen which proves some reproductive success following hurricane Ivan and flooding that year. It was only with *G. barbouri* in Florida and *G. ernsti* in Florida and extreme southern Ala-

A hatchling Alabama map turtle (*Graptemys pulchra*) basks in a brush pile on the Coosa River. Photograph by the author.

Houseboats on the flooded Pascagoula River in southern Mississippi. Photograph by the author.

bama that hatchlings were not observed.

When these rivers flood, (the Pascagoula in Mississippi, for example) the water fills the nearby floodplain. This can sometimes extend as far as a mile from the normal river channel. The Gulf Coast *Graptemys* generally do not wander too far from the actual corridor of the river during flood events (Ernst et al., 1974). Many attempts to spot turtles in the flooded forests resulted in failure. However, during flood stages you can still see adult turtles basking alongside the original river channel at the tops of trees (now at the surface of the river) that lined the previously exposed banks. Smaller turtles were also observed alongside the main corridor during flood conditions, but in the calmer areas such as behind large brush piles, bridge pylons or houseboats (Ernst et al., 1994).

In summary, I reiterate that *Graptemys* populations in the Gulf Coast region are adapted to hurricane conditions. Even with the loss of a single or multiple years' offspring due to flooding, stable populations can be sustained given the survival of the adults. Hurricanes reconstruct *Graptemys* habitat by causing trees to fall in the water to form new brush piles. Numerous brush piles provide these turtles with more shelter from predators, more surface area to feed from, and more areas to bask. An increase in the amount of brush piles enables the entire population to spread out in the river system, as opposed to being concentrated in a few areas.

On August 29, 2005, the Gulf Coast region experienced another hurricane, Katrina, as it struck Louisiana, Mississippi and Alabama. This deadly and devastating storm was more powerful than Ivan from the previous year and did unspeakable damage to the people of that area. The path of Katrina was just a little west of Ivan's path. This Category 4 hurricane has undoubtedly affected the river systems containing the yellow-blotched map turtle (*G. flavimaculata*), ringed map turtle (*G. oculifera*), and the Pascagoula map turtle (*G. gibbonsi*) in Louisiana and Mississippi. Many pollutants will find their way into these rivers when the water recedes from towns and neighborhoods. The combination of noxious, even toxic substances, such as lead and bacteria, that ends up in the river can be as detrimental to riverine species as to humans. Monitoring trips to this area will be conducted in the near future in order to document the effects on the turtles and their habitat.

Acknowledgments

I thank everyone who helped with the monitoring and observations, especially Ron and Dottie Humbert, John Archer, Shane Johnson, Pete Wilson and Nicole Lechowicz.

Barbour's map turtle (*Graptemys barbouri*). Photograph by Bill Love.

Escambia map turtle (*Graptemys ernsti*). Photograph by Mike Redmer.

Both of these species showed low reproductive success following hurricane Ivan and sustained flooding in Florida and southern Alabama.

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Courtship and Ritualized Combat Behavior in the South American Xenodontine *Boiruna maculata* (Boulenger, 1896)

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Introduction

Often regarded as the least social of all reptiles, snakes are actually capable of displaying a remarkable degree of behaviors. Primarily centering around reproductive activities, these inter- and intrasexual interactions involve the use of varying degrees of visual, chemical, and tactile cues (Gillingham, 1987). For reproduction to be successful, snakes must locate, persuade, discriminate among, and synchronize behavior with a potential mate (Greene, 1997). Occasionally, males must also compete by way of wrestling-like combat bouts for the right to copulate with a female.

Courtship and combat behavior was observed in specimens of the southern mussurana species *Boiruna maculata*, formerly known to as *Clelia occipitolutea*. Ranging from northern Argentina, Uruguay, Paraguay and Brazil, *B. maculata* is a moderately large, black snake (to 168 cm SVL) with enlarged rear grooved fangs and a venom-producing gland (Zaher, 1996). A member of the colubrid subfamily Xenodontinae, this primarily ophiophagous species is one of the few snakes to employ both venom and constriction to subdue prey. Reproductive behavior has not been described in this species; however, a reproductive account of the closely related *Clelia clelia* can be found in literature (Martiñez and Cerdas, 1986). Here I describe captive observations of courtship and combat behavior in *B. maculata*, and compare these observations to previous descriptions of reproductive behavior in other colubrids.

Two male (male "A": 152 cm TL; male "B": 150 cm TL) and one female (150 cm TL) *B. maculata* were housed singly in large plastic enclosures measuring 152 × 50 × 30 cm (l × w × h) with screened lids. Each enclosure was furnished with a large water bowl, cork bark, and a cypress mulch substrate. Specimens were fed from 1 to 4 adult mice per week. Introductions were made between January and July 2005.

Courtship

The following description is based upon five courtship sequences that were observed between 20 January and 25 July 2005. Phase 1 behaviors always began with tongue flicks by the male on the female's dorsum. Although visual cues are important in bringing individuals together, the detection of the female's pheromones by the vomeronasal organ of the male is considered crucial in courtship (Mason, 1992). Initial contact by the male usually resulted in the female responding in a jerk. The male would attempt to mount the female (dorsal advance behavior), however, this action generally resulted in the female trying to flee from the male. Repeated attempts would result in a mount by the male while positioned over the female in a loose, coiled-to-slightly-outstretched position. During the

mount the male displayed typical colubrid behaviors such as lateral sliding movements, writhing and jerking. Chin rubbing was only occasionally observed.

Tactile-alignment behaviors (Phase 2) occurred while the male was positioned over the female in a loose, coiled to slightly outstretched mount. Intense lateral sliding movements along with dorsal advance and writhing behaviors occurred while the male would attempt to align his cloaca with that of the female (tail-search copulatory attempt). Cloacal gaping by the female was not observed during any of the five courtship encounters.

The third phase of courtship began with intromission of one hemipenis into the female's cloaca. The male's tail was not always aligned parallel that of the female's tail but would sometimes be positioned perpendicular to that of the female. Both snakes remained relatively quiescent during copulation. Courtship encounters ranged from 6 to 12 min in entirety.

The 25 July 2005 introduction proved to be a notable exception from the other courtship sequences in that biting by the male was observed to occur on two areas of the female's dorsum. While both specimens were positioned in a loosely coiled position prior to intromission taking place (Phase 2), the male was observed to bite and hold onto the female's dorsum, immediately adjacent to her cloaca for approximately 15 seconds. After continued movements by the female, the male broke his hold. Within seconds, however, a quick succession of writhing and lateral sliding movements proceeded successful tail-alignment and intromission at which time the male again seized and held onto the female by her dorsum at midbody. Copulation lasted approximately 4 minutes before the male relinquished his grip.

Combat

Ritualized male combat behavior was observed on 20 January 2005 after introducing the two male *B. maculata* into an enclosure housing the female. Considerable tongue flicking was initially noted as both males investigated the enclosure. Male A displayed a short upper body jerking behavior when contact was made with the integument of male B. Male B lashed his lower body in response to this initial contact. Male A attempted to mount male B without success initially; however, continued persistence allowed male A to mount and entwine or loop his body on that of male B. The mounting behavior of male A was always followed by male B attempting escape. During the entire combat sequence, both males remained in an outstretched horizontal position (see Figure 1) as described for other colubrids (Gillingham, 1987).

Head-pinning behavior was not performed during the combat sequence, however, body-pinning as reported in other colubrids was observed (Gillingham, 1987). Male A always maintained a superior position over of male B, eventually resulting in the rapid retreat of male B, often accompanied by body or tail lashing. The female remained in close proximity during the entire sequence (enclosure size was a limiting factor for movement). After male B broke away from male A, the dominant male's attention quickly turned toward the female. The entire bout spanned approximately three minutes. Subsequent introductions have not resulted in combat or agnostic behaviors between either male.

Discussion

Courtship behavior in *B. maculata* is similar in many aspects to reproductive behaviors described in other colubrids. Initial male-oriented phase 1 behaviors include recognition via tongue-flicking and a series of tactile stimuli that include dorsal advance, writhing and lateral movements upon the female's dorsum. Phase 2 behaviors include attempts to align tails along with tactile behaviors displayed during phase 1. The use of biting by the male during phase 2 and phase 3, however, is noteworthy in that this behavior has not been reported before in snakes of the subfamily Xenodontinae, a lineage of moderate- to large-sized snakes sharing certain morphological similarities.

While biting during reproduction is known to occur in a variety of reptiles, in snakes it is predominantly confined to non-natricine species within the family Colubridae (Carpenter and Ferguson, 1977; Secor, 1987). Biting appears to have two functions. The courtship bite, a behavior occurring during the tactile-chase phase of courtship, is generally described as a quick release bite to the female's body employed as a stimulus to cause the female to change to a more favorable position for copulation (Gillingham, 1979). The coital neck bite occurs during the intromission phase of courtship and is believed to function as a means to subdue and hold the female during copulation (Carpenter and Ferguson, 1977) or enhance receptivity (Gillingham, 1974). The coital tail bite, a behavior reported only in dwarf boas of the genus *Ungaliophis*, occurs from the first phase of courtship and is maintained until dismount. As does the coital neck bite, it appears to function as a means to

Figure 1. Combat in two male *Boiruna maculata*.

subdue and hold the female during copulation (Burger, 1996).

It has been suggested that biting might be selected against in boids, crotalids and elapids due to the potential injury that may be incurred by the elongated teeth and fangs as well as possible envenomation by the venomous species (Secor, 1987). However, reports indicate that biting during courtship is occasionally exhibited in some boids (Yadav, 1967; Burger, 1996) and mildly to highly venomous snakes (Campbell and Quinn, 1975; this study).

Agonistic behavior (other than combat) during introductions has been reported by Martiñez and Cerdas (1986) in the closely related *C. clelia*. These authors report that the female was an initial aggressor before the male became actively involved in courting behavior. Similar reports indicate that the ophiophagous habits of this species may occasionally circumvent mating opportunities, with the mate becoming a potential meal (Solórzano, 2004; R. A. Young, pers. com.). Aggressive behavior, other than the bite/hold exhibited by the male on two occasions was not observed in either sex during these encounters.

Combat behavior has been reported in over 124 species of snakes (Shine, 1994). Unlike most other colubrids that show ritualized combat behavior, females of both *Boiruna* and *Clelia* generally attain a larger body size than males (Cei, 1993; Savage, 2003; Zaher, 1996). In observations during this study, typical colubrid behaviors were displayed such as maintaining a horizontal posture throughout the combat ritual, jerking and body-pinning. Other combat behaviors often reported in male-male encounters, such as head-lifting, biting, body coiling, and hovering (Carpenter et al., 1976) were not observed.

Comparatively few observations regarding reproductive behavior in tropical snake species exist. While certain biological aspects such as diet are well known in mussurana species, these are the first descriptions to document courtship and combat behavior in the mussurana genus *Boiruna*. Although visual and tactile cues are considered important during reproduction in many snake species, the observation of considerable tongue-flicking preceeding all reproductive events during this study provides further evidence that pheromones play a crucial role in mediating reproductive behavior in snakes.

Acknowledgments

Gratitude is expressed to Bob Young for sharing his experience at reproducing *C. clelia*.

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Herping in Australia—Field Notes and More
Part 8: Frogs, Snakes and Frogs Again

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When the Sun Shines, Catch Reptiles;
When It Rains, Go Frogging!

People who visit Sydney are always besotted with the scenic beauty of the place. Be it the city on the harbor, the beautiful beaches, or simply the cloudless blue skies that typify the weather at most times of the year. For the herper, the bushland, with its relatively pristine vegetation, even close to the city, the fantastic habitat provided by the hills and rocks, make a trip to Sydney memorable for a lifetime.

And yes, this is generally against a backdrop of clear blue skies and a pleasant climate. Notwithstanding the opinions of Sydney locals and for that matter the herps, the underlying theme of the weather in Sydney is its mildness. Because of its coastal location and prevailing winds and weather patterns, the place is invariably milder than is generally seen for other places on a similar latitude. The summers are warm, but never get the consistent heat found in other parts of Australia. This is particularly so for the good herping spots along the coast and in the Blue Mountains.

Winters are also milder than seen elsewhere in Australia, due in part to the onshore winds from the sea and balanced by the down mountain winds from the west, which also act as a rainshadow for the cold wet weather that comes across from the west. Thus the winters are characterized by long spells of dry sunny weather, without the freezing cold seen by most inhabitants of Europe or North America.

But because of its location on the coast, the warm sea currents and the blocking effects of the mountains, there is another feature of Sydney's weather most people cannot help but notice. That's the humidity. Added to the humid sea breeze that dominates most afternoons for most of the year, is a generally high annual rainfall (50–100 cm a year in most areas) that is spread throughout the year. Thus, most days are humid and the ground is usually wet, even when there hasn't been much rain. That in itself is a good start for the frogs.

Now as I've mentioned, Sydney is usually a sunny sort of place, but several times a year another distinctive weather feature comes into play. That is the big offshore lows! These are the low pressure cells that form in the wake of the highs and usually when the next high is a bit slow in following behind. Typically a front passes through Sydney and then a low pressure area builds up in the adjacent seas, bringing along a wet onshore air stream.

In short this means lots of rain. To Sydney-siders this sometimes translates to be days on end of driving and torrential rain. And while this weather isn't too great for catching snakes and lizards, it's just dynamite for the frogs!

Now I've already told you about the frogs from Kurringai Chase. These you can catch more easily in the wet weather. You'll find a similar selection of frogs in the other sandstone national parks as well, although there are quite a few species I haven't yet mentioned here.

While frogs come out on all sorts of nights, by far the best time to find them on the roads around Sydney is in the months of October to December and when it is raining solidly (and not just the stop/start sort of stuff). Fortunately these optimal conditions occur a few times each spring and so, if you are in Sydney at this time of year, you can really have some fun. Typically you leave the city at dusk and when you know that the rain is continuous.

Without doubt the best place to frog hunt if you live in Sydney is about an hour's drive to the north. The roads to the north of Gosford and west of these areas are the most fruitful. I'll recall one night here in November 1982 when I went on a drive with some herper friends to this area. We drove first into the Wattagan State Forest. This is a set of ranges to the west of Morriset and Wyong, some 100 km north of Sydney.

These hills are covered in wet sclerophyll (eucalyptus) forest, and although the area is hilly, most of the sandstone rocks tend to be along the watercourses only. On the dirt roads leading into the forest, the going is slow, but we had no troubles with our standard two-wheel-drive car. Besides nearly running over a large wombat (*Vombatus ursinus*), we saw a relatively small number of frogs crossing the road. These were a medium sized brown frog (*Lechriodus fletcheri*), and two similar looking, but much larger frogs namely *Mixophyes iteratus* and *Mixophyes balbus*, both of which are known commonly as barred frogs. These are among the largest species in Australia and typically inhabit moister habitats in forested areas and breed around the watercourses in these places. Closer to Sydney, I've never seen these frogs, save for a few specimens in a deep valley near Helensburgh to the south of the city and in the Grose River Valley west of Blackheath in the Blue Mountains. Those specimens I found when wandering around large creeks at night.

When we stopped at a rocky creek, we found several more *Mixophyes iteratus* as well as a single adult golden crowned snake (*Cacophis squamulosus*) crossing the creek just above a waterfall.

Because the purpose of our trip was to get as many different species of frogs as possible to photograph, we made a point of seeking out each and every species likely to occur in an area as best we could. Part of this involved stopping at as many different types of watercourse that we could and listening for frog calls. If we heard one that wasn't familiar, we'd then go out with our torches and try to find what was making them.

Upon stopping for a small brown frog on the road heading out of the ranges at the northern end, we heard a gaggle of calling that we didn't recognize. Wandering into the black and rainy forest, we found a dam and around it were numerous *Litoria chloris*. Without doubt these are one of the most beautiful frogs from eastern Australia. Bright green and with yellow undersides they are reasonably large and robust tree-frogs and I have never ceased to be amazed at why there aren't more of these in captivity.

Meanwhile the small brown frog we'd stopped for had been a broad-palmed frog (*Litoria latopalmata*). This ground-dwelling treefrog species is common in various habitats, in particular the margins of forested and cultivated areas around dams and other man-made watercourses.

Heading back towards Sydney along what was then the main highway (there's now an expressway there), we drove through the flat clay-soiled areas of Wyee, Warnervale and Wyong. Here we found numerous dam-dwelling burrowing frogs, including *Limnodynastes ornatus* and *Limnodynastes dumerilii*. There were literally hundreds of frogs on the roads. Besides these we also found a smattering of other species, including the leptodactylid species *Limnodynastes peronii* and *Limnodynastes tasmaniensis*, both of which are common throughout southeast Australia, and usually more so in farming habitats. Ubiquitous was the green treefrog (*Litoria caerulea*), readily seen as big green blobs on the road.

As we headed south of Wyong towards an area known as Dog Trap Road (Ourimbah) we found yet more frogs on the main Pacific Highway, including the first Lesueur's treefrogs (*Litoria lesueuri*), which is a largeish, brown-colored, ground-dwelling treefrog.

In the middle of nonstop two-way traffic were numerous smaller frogs jumping about and others lying about splattered by passing cars. These included some of the species just named as well as the smaller ground-dwelling leptodactylid *Ranidella signifera* and the tiny green treefrog *Litoria fallax*. And yes, throughout all this, it was nonstop torrential rain as only a Sydney low-pressure cell can bring!

Heading up Dog Trap Road, the area is essentially a collection of farms in a valley surrounded by hills that are part cleared and part native bush. The valley floor is essentially flat and Dog Trap Gully Creek is a generally polluted watercourse that runs down the middle. However, throughout all this hotch-potch is a myriad small and medium-sized farm dams and associated swamps, all of which teem with frogs, tadpoles and other critters.

By day in the area I'd caught tusked frogs (*Adelotus brevis*) under logs close to the dams and red-bellied black snakes (*Pseudechis porphyriacus*) sheltering under various man-made rubbish. By night, this road was crawling with frogs.

There were way too many to stop for, and yes we ran many of them over. Put simply, they were way too numerous to try to swerve for them. Not only that, but the species list was nearly as comprehensive as that just given for the night so far.

There were other species we found lots of around Ourimbah, including the medium sized greyish colored treefrog *Litoria peronii*, the slightly smaller tree frog *Litoria verreauxii* and the even smaller species *Litoria dentata*. Add to that the already mentioned small green treefrog *Litoria fallax* also seen bouncing all over the roads and you soon realize that here in one night you get to see a decent swag of the species diversity known from the entire Sydney region.

Neither the tusked frog (*Adelotus brevis*) nor another species I'd found in the immediate area previously (*Litoria aurea*, the green and golden bell frog) were to be seen on this night. However, we did find the creek-dwelling leaf green treefrog (*Litoria phyllocroa*) on the road this night, the first time ever that I'd actually seen this species crossing a road.

After catching what we thought was a fairly comprehensive listing of species from here, or at least what we thought we'd be able to find on this night without too much difficulty, we headed back for Sydney. Instead of taking the main freeway, we went down the "Old Pacific Highway," which runs parallel through the sandstone escarpment of the Hawkesbury Plateau. The main feature of this road is that it lacks traffic.

Here we saw the sandstone staples, including Freycinet's frog (*Litoria freycineti*), which is another ground-dwelling treefrog, giant burrowing frogs (*Heleioporus australiacus*) and banjo frogs (*Limnodynastes dumerilii*), as well as a more generalized species, the tiny brown *Ranidella signifera* which tends to pop up almost anywhere you find a few puddles and had been turning up all over the place on this night. Besides the *Ranidella signifera*, somewhere around Wyong, we'd also picked up a few other small brown frog species in some drainage ditches near the road. These had been the toadlets *Pseudophryne bibronii* and a species of *Uperoleia* (probably *marmorata*), which is similar in appearance and habits.

Now was this an exceptional night? In a word—NO. In fact it was actually quite ordinary. You see other species known from these areas and missed on this night included a rarer species *Litoria brevipalmata*. It's another medium sized treefrog species. It's most commonly found at night in the farming habitats on the wet forest margins from just north of Sydney and along the New South Wales north coast.

Then of course we missed out on *Litoria aurea*, which along with *Litoria brevipalmata* seems to have undergone a sharp decline in the region over the last few decades.

Since that night, I've done similar trips to the same area. One drive at the end of the warmer months in late April was by comparison a failure. Frog numbers were down by about 80% and the species biases were also different, with the total number of species seen down to about 60% of what was seen in the spring.

But I must make a point of saying that even down by 80% in number in this area meant a hell of a lot of frogs. In other words, if you are in Sydney at any time of year (save for the middle of winter) and you want to see lots and lots of frogs, then just wait for the big offshore low and the torrential rain it brings and then take a drive north up the Pacific Highway to the back roads beyond Gosford. Any other areas around Syd-

ney will seem devoid of frog species diversity by comparison.

Knowing It All

With any activity, the more you do it, the more you get to know what's what and who's who. This holds true for night driving bush roads for herps. Having driven roads in search of herps in all Australia's mainland states, I claim some expertise in knowing what is likely and what's not.

There are also a few truisms of note. If you see something like a snake jumping up and down on its tail, like a spring in a box or something, you know it's a legless lizard and usually a *Delma* at that! If it is thick and moves in a concertina fashion, then it's bound to be a python. And if you find a snake coiled up on a roadway, you can bet your house that it's already been hit by a car. If someone wants to argue the point, by all means do so. But just not with me!

I've learnt that snakes cross roads, slowly and fast, and yes, sometimes they even crawl quite a distance along them! But they almost never coil up and rest on them. However, once hit by a car and in agony as their internal organs sit there crushed beyond hope, the pain will often immobilize a snake in pain and the result seen is a coiled snake. Now sure, you may pull up and see a perfectly healthy looking snake all coiled up on a road and if you look closely you may not see even the slightest sign that the snake has been hit by a car. But please take me on faith on this one. It almost certainly has been.

You see contrary to common belief, not all snakes run over by motor vehicles have the external wounds to show for it. While some snakes end up in pieces all over the road, it's probably just as common for a snake to appear to be unscathed. However, invariably the internal organs have been irreparably crushed and/or damaged and death is inevitable.

Sometimes death may occur within minutes; sometimes within hours; other times it may even take days! But as sure as night follows day, if a snake has been hit by a car, it'll die.

Now although a curled up snake on a road is effectively a sure-fire indicator that a snake has been hit by a car (or truck or whatever), not all snakes hit by motor vehicles necessarily coil up and wait to die. Many simply crawl off into the nearby bush to slowly die. And so, it's not uncommon to capture an apparently alive and healthy snake from a road, only to open the bag an hour or two later to find it dead.

I've lost count of the times when I've found an apparently healthy snake die inexplicably a day or two after being picked up from a roadway. At this stage, the snake becomes relatively easy to inspect. A mean, vicious 60 cm tiger snake (*Notechis scutatus*) may not be easy to take a close look at in life, but as a corpse, suddenly becomes easy! And yes, if you inspect any of these newly dead snakes, you are bound to find out the real cause of death . . . hit by motor vehicle.

A close look at the snake will usually see at least a few raised scales in the general area where the tire has run it over. Usually also visible is a general flattening of the body where the tire has passed over. For while the snake's body will spring back into shape after being squashed by a tire, it never seems to go quite back to where it should. And that is usually the indelible telltale sign that the snake has been hit.

All of which goes to prove that the carcasses seen by herpers on the roads represent but a mere fraction of the total death toll caused by humans and their cars. And yes, I have yet to recall a single time that I have ever seen a coiled snake on a roadway that was sitting like that without having been hit by a car or truck. The closest I've got to this are a few earless dragons (*Tympanocryptis cephalus*) that have decided to sleep on some outback roads in northern Queensland and the adjacent parts of the Northern Territory. But they obviously don't coil up like snakes.

I'm also going to tell you about a bandy bandy (*Vermicella annulata*) I once found on the Woronora Dam Road to Sydney's south. It was a normal snake-hunting night so to speak. And this road has all the usual Sydney sandstone species including broad-headed snakes (*Hoplocephalus bungaroides*). As I and fellow herper Charles Acheson drove south along the road we saw a subadult bandy bandy facing west, but sitting stationary on the east side of the road. As we stopped the car it did a U-turn and fled back into the bush. We were unable to catch the snake, which quite simply was too fast! After a brief rummage around the bush we continued our drive, before ourselves doing a U-turn at the southern end of the road.

Heading past the same spot, we again saw the bandy bandy sitting on the same spot of the road. It again did a U-turn and disappeared into the bush. We drove on, but suspecting that the snake might again "bask" on the road, we U-turned well before the northern end of the road to again pass the spot where the snake had been seen. This time it was almost across the road (on the west side) and instead made off into the bush on that side of the road (no U-turn), and this time we actually caught it.

So what exactly did this prove? Namely that the snake wasn't basking on the road at all, but rather it had always been trying to simply cross the road and that we'd been disturbing its progress every time. And yes, because we had been startling the snake with our car's headlights, the snake had obviously paused as we approached in the car, thereby giving us the view that the snake had been stationary and was basking on the roadway. The basking idea obviously was a fallacy.

Now I've heard many a herper talk about how roads retain heat at night and how reptiles will move onto them to bask. The inference being that the roads are the warmest places around for the snakes. But this theory simply doesn't hold true as far as I can make out. Here's why. While it's true the roads hold heat, so too do countless other places away from the roads, such as rock ridges and the like. And quite frankly, after checking both sorts of places with a probe thermometer (to test the preceding theory) I found there was absolutely no difference. Also, the other point of note is that the snakes found on roads are active and moving, which implies that they are already at a temperature they like and thus would have no need to "bask" on a road.

There are other points of note, including that nocturnal snakes tend to select their resting positions in view of pre-

ferred temperatures (particularly in cooler months). But the idea that they are being active on roads and crossing them with a view to basking on them for warmth, just doesn't seem to wash with me.

Just When You Think You Know It All . . .
You Find Out That You Don't

And so I'll relate a couple of relatively recent night driving experiences I had, just to prove the points made above and another point—this being that no matter how many times you've been in the bush looking for a given kind of herp, you may still never know it all. And the two examples I'm going to give were on the very same night!

To set the scene, I'll tell you about the night in brief. I was in the usual place . . . the West Head/Cottage Point area of Kurringai Chase, just north of Sydney. The date was 21 February 2002. The weather that day had been fine, hot and seasonally above average. The time of drive was from 8 to 11:30 P.M. At this time there was little wind, save for a very slight northeasterly that blew at times during the night. The sky was clear with some low see-through clouds coming over from the northeast. There was a moon in the sky all the time while driving (it set after midnight), which was obviously a factor working against me finding too much in the way of herps that night. The air temperatures at time of drive ranged from 24 to 22°C. And yes, all animals seen on this night were seen when the moon was totally visible and casting its full light.

The list of wildlife species seen crossing the roads that night is as follows:

- 1 Pigmy Possum (*Cercartetus nanus*) at about 8:20, freshly run over on the road
- 1 smallish adult Bandy-bandy Snake (*Vermicella annulata*) (see my account below)
- 1 smallish rat-like animal live at about 11 P.M.
- 1 sub-adult Southern Leaf-tailed Gecko (*Phyllurus platurus*) at top of a hill with a full (original tail) at about 11:05
- 1 adult male Giant Burrowing Frog *Heleioporous australiacus*, (see my account below)

First I'll let in on the bandy bandy story. At about 10:30 P.M. on the Cottage Point Road a silver Porsche sped past me in the opposite direction. It was just one of a number of cars that had passed me during the night. Minutes later and as I descended the hill at the midpoint along the road and headed towards Cottage Point, I saw a bandy bandy apparently "basking" in the middle of the road. It was sitting in a broad horse-shoe-shaped coil.

Now in my mind, this is good enough to be a coiled up snake. After all, it wasn't crawling across the road (from "A" to "B" as I say that all snakes generally do). I walked up to the snake and it turned and crawled away towards the side of the road in what appeared to be a perfectly normal manner. But I just *knew* it had been hit by a car. Sure enough, a close inspection saw blood streaming from the snake's mouth and the front end of the snake was distinctively stiff and flattened. That was where the tire had passed. Perhaps I should have put the snake out of its misery, but I didn't. Instead I just watched it crawl into the bush to a slow, agonizing death. And so my theory that nocturnal reptiles and frogs cross roads to get from "A" to "B" and not to feed or bask, remained intact.

Now there are many reptiles that take up residence around roads for either feeding or breeding reasons. West of Dubbo (New South Wales), the roads are generally built higher than the adjacent country and the side walls of the structures themselves provide much sought after refugia for species like bearded dragons (*Pogona* spp.) and bluetongue lizards (*Tiliqua* spp.).

Also when the roads are built, the dirt used to elevate the road surface that meter or two above the surrounding countryside usually comes from immediately adjacent. And so it is common to see a ridge-like road running parallel with one or more long ditches. These ditches provide great breeding spots for the frogs. And so the road becomes an effective magnet for herpetofauna.

This increases when one factors in the boxes and other rubbish that humans throw out of their cars, thereby adding to locally available cover, as well as the food scraps, which may be scavenged by creatures as diverse as insects, monitors and birds, which themselves provide food for yet more creatures. But none of these factors that make roads and their immediate environs a magnet for herpetofauna in any way serve to rebut my general hypothesis that it is so uncommon as to be noteworthy that a healthy live snake should coil up and rest on a road surface.

To all you herpers out there, my advice is that if you do indeed find a snake coiled up on a road at night and find that it hasn't been hit by a car, take down all the details and publish a paper on it!

Now the idea that creatures like lace monitors (*Varanus varius*) and the like scavenge and feed from road surfaces is nothing new. I've seen it around Sydney and elsewhere and so too have most other experienced herpers here. But what hasn't been generally observed is the same practice in frogs.

And yes, up until very recently the conventional wisdom was that this just didn't occur. But this night conventional wisdom took a hiding. It involved an adult male giant burrowing frog (*Heleioporus australiacus*) that I saw on the road. It was on General San Martin Drive about 100 m from the first toll booth near McCarr's Creek Road (Terrey Hills). After three more passes on the same piece of road I noticed that the frog was still on the road and had moved from one side of the bitumen to the other (as if crossing the road—as my conventional wisdom suggested), but then back again to the side of the road it had been originally seen on. Surely this frog could not be so scatterbrained as to not be sure where it wanted to go?

Whether by chance or otherwise, the frog always seemed to be in the area of the road which allowed cars to pass over it (on one side or the other of the road), with each wheel on either side of the frog and the frog not being hit. As a result of the obvious fact that this observation apparently went against my conventional wisdom that most reptiles and frogs

seen on roads are merely crossing from one side to the other, I pulled up near the frog on the fourth pass. I then turned off the car's engine and headlights and observed the behavior of the frog, which seemed to ignore my presence.

All this was possible due to the good illumination provided by the ever-present moonlight, the fact that I remained still at materially relevant times and the added help provided by the headlights of passing cars. Over the next 20 minutes ten cars were observed to pass the frog, either over it, or on the other side of the bitumen. Following the passing of a car directly over the frog, it'd move its body around in a circular motion, clearly looking for fallen insects. Generally the frog wouldn't move away, unless it took up an insect, in which case the frog would hop towards the food and lap it up. This I saw twice.

In general the traffic was leaving the national park and hence the frog was situated on the same side of the road that this traffic was passing. However, once a car passed on the opposite side of the road to where the frog was. The frog then responded by hopping across the roadway to where this car had passed and positioned himself on that side of the road in the path of more oncoming traffic.

Within a few minutes another car passed on the other side of the road (leaving the park) with the frog then moving back to that side of the roadway. After observing the frog's behavior for 20 minutes, I drove off and continued spotlighting for about another 40 minutes. However I noted that the frog continued to hunt and feed in the path of oncoming traffic (when I passed this spot). On the final pass of this piece of road at about 11:30 P.M., the frog was still alive and well and sitting in the path of oncoming cars. In all, well over 20 cars must have passed over the frog, but it was never hit! To my mind, this feat surely beats that of the cat with nine lives!

Now this instance of road feeding by an adult *Heleioporus australiacus* at night is the first such case I have seen. That the behavior is not common, would be assumed on the basis that specimens that do this would soon be hit and killed by passing traffic. However, bearing in mind that few people who go spotlighting for frogs on roads at night actually stop to observe the behavior of frogs seen on roads, the behavior seen in this frog on 21 February 2002 may in fact be far more common in frogs and other wildlife than previously thought.

Thus it is possible that further research into this habit could lead to some roads being seen as feeding vacuums for frogs from the adjacent countryside. But as there is little doubt that frogs that engage in deliberate road-feeding behavior invariably get hit and killed by cars, it always can be assumed that selection pressures would work against the habit. Notwithstanding the preceding, it may a worthwhile avenue of research by a postgraduate student to see just exactly how many frogs of given species actually engage in road-feeding behavior as a result of a predisposition to engage in it, as well as the mortality rate within a given population arising from deliberate on-road feeding.

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Book Review: *Amphibian Declines: The Conservation Status of United States Species*

Edited by Michael Lannoo. 2005. xxi + 1094 pp. Univ. of California Press, Berkeley 94704. Available from California Princeton Fulfillment Services. ISBN 0-520-23592-4. Cloth. $95.00.

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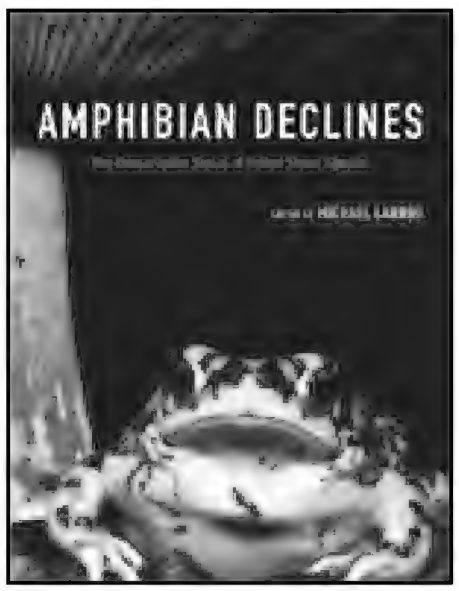

Amphibian Declines: The Conservation Status of United States Species is the second volume edited by Michael Lannoo on the conservation of our precious amphibian fauna, which has been drastically altered in the past two decades from various factors, some of which remain unknown. It is known that habitat destruction resulting from agriculture, urban development, timber harvest/silviculture, livestock grazing, altered fire regimes, recreational land use or development, road construction, mining and pesticide overuse has been a major factor, while ultraviolet radiation, water source manipulation, diseases, exotic species introductions, chemical contamination, collecting/harvesting and acid rain have all been contributing factors. Many other factors may also be culprits. *Status and Conservation of Midwestern Amphibians*, also edited by Mike Lannoo, was published in 1998 by the University of Iowa Press. Both these volumes will certainly stand as landmarks for the conservation of amphibian species within North America.

Part one of *Amphibian Declines* contains 52 essays and other articles relating to population decline causes, conservation politics and the need for protection of our native fauna. Included are sections on methods for monitoring and surveying populations, and the education of the government and people about the drastic need for assistance in protecting our native fauna.

Part two covers the species accounts for all known species of amphibians found within the boundaries of the United

States. Previously, no detailed account for all of the known species existed. The introduction to the species accounts was written by Michael Lannoo, Alisa L. Gallant, Priya Nanjappa, Laura Blackburn and Russell Hendricks. The individual species accounts were written and reviewed by experts on each species. All the accounts are backed by references to the scientific literature, unpublished data, or personal communications. It is hoped that these accounts will serve as a foundation for others to continue much-needed further research in areas not covered by the distributional maps and stimulate future research on specific topics not covered in the accounts.

The authors define species based on Crother et al. (2000, 2003) with the following exceptions: (1) they recognize the existence of silvery salamanders (*Ambystoma platineum*) and Tremblay's salamander (*A. tremblayi*), and they recognize the existence of unisexual *Ambystoma* hybrids. They recognize the Arizona toad (*Bufo microscaphus*) and California toad (*B. californicus*) as separate species. They consider *Bufo nelsoni* and *B. boreas* to be separate species. They consider *Rana draytonii* and *R. aurora* to be separate species. They acknowledge dark-sided salamanders (*Eurycea aquatica*). They recognize that both the green-and-black dart-poison frog (*Dendrobates auratus*) and the Martinique greenhouse frog (*Eleutherodactylus martinicensis*) are established in Hawaii. Finally they include two species of *Eurycea* and one of *Necturus* that have yet to be described.

The species accounts comprise 532 pages—nearly half the text. The accounts cover all the known species of amphibians found within the United States. The species accounts per se are preceded by the above-mentioned introduction describing the methods and ecoregions, along with maps showing the amphibian species richness at the family level, the richness of introduced species, species with terrestrial eggs, species with aquatic eggs, larval, and adult stages, species that develop in water and breed in standing water, species that reproduce in flowing water, endangered species and species of special concern with the United States. The introduction includes seven appendices: A) a comprehensive list of species including current specific names and common names; B) species with terrestrial eggs; C) species that exhibit some form of parental care or communal nesting; D) genera or species with aquatic eggs, larval and adult life-history stages; E) species that breed in seeps, springs or small streams; F) species found in caves; and G) federally listed species.

Each of the individual species accounts provides the family, scientific name, and common name followed by comments on the systematic status, historical and current distribution, historical versus current abundance, life history notes on breeding, eggs, larvae/metamorphosis, juvenile habitat, adult habitat, aestivation/avoiding desiccation when known, seasonal migration, interspecific associations, age/size at reproductive maturity, longevity, feeding behavior, predators, anti-predator mechanisms, diseases when known, conservation and parasites of the organism. An excellent distributional map showing the overall range of the species is also provided for each species.

The species accounts are followed by an epilogue compiled by David F. Bradford of the USEPA National Exposure Research Laboratory in Las Vegas, Nevada. Based on the information in the species accounts, Bradford characterizes the amphibian declines in the United States. He compiled statistics on factors implicated in the declines and assessed the status of each species with regard to the stability of its distribution and population numbers.

Bradford reviewed drafts of the 267 species accounts available at the time (91 of 103 anurans and 176 of 185 caudates). He classifies almost half of the 91 anurans and well over one-third of the caudates as "adversely affected species." Only five anuran species and no caudates appeared to be increasing their ranges. He provides tables and figures illustrating the frequency status (increased; no change; extirpated; major decline; not determined) for both anurans and caudates. The figures break down the frequency data in various ways (e.g., by family, by region, by implicated factors).

The epilogue is followed by a massive (148-page) and comprehensive Literature Cited section, along with a highly useful index.

We would certainly recommend this book for every library in the continental United States, as the cover will certainly attract even those laymen having only seen scattered newsprint articles regarding amphibian population declines, and possibly stimulate more people to become aware of what is happening to our environment.

Every herpetologist will certainly want this volume on his or her bookshelf as the most valuable work yet available on our amphibian fauna. The editor and contributors should be commended for this massive project, along with the publishers in taking over this project and producing such an excellent volume.

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HerPET-POURRI

by Ellin Beltz

Foreword

In much the same way as we think before and after 9/11, so too have we begun to think of before and after the devastating hurricanes and resultant destruction and flooding visited upon the Gulf Shore from Louisiana through Mississippi and into Texas. Stories familiar to all include the staff of the Audubon Zoo weathering Katrina in the reptile house and their heroic struggle to save all the animals while outside humans waited in vain for rescue or fell victim to human predators in areas of presumed safety. And, like 9/11, we'll all remember where we were when we "heard about New Orleans." In my case it was at the Burning Man art festival when a glazed young woman covered head to toe in tribal tattoos came into our camp crying, "The whole city is under water, my studio is flooded, there's people shooting people in the Superdome and we've all got to do something!" Hermes flew on, but I was left with an emptiness behind the joyous festival which continued until today when I realized I have survivors' guilt. This column has survived all other natural disasters for nearly two decades, I realized it was time to write this column of herpetological miscellany for one more time! As they say in many other endeavors: the show must go on.

Contribute to a herpetological icon

Allen Salzberg writes: "As you know *HerpDigest*, a non-profit organization, for over five years has existed on foundation grants, generous donations from individuals, special sales, money from my own pocket, and this year, for the first time, subscriptions. . . . The support this year that we received from the foundations has totally dried up. . . . Unable to find any foundations or other organizations to replace the lost grants, we are now totally dependent on individual donations and subscriptions . . . [which have] not increased over the year and so the future of *HerpDigest* is bad. If we are to continue doing what you say we do so well, we need to raise money to continue, fast. Almost $10,000. Over 5,000 people receive either *HerpDigest* or *HerpDigest Lite*. A good 95% of them receive *HerpDigest Lite*, the free version. Those who have helped in the past through donations, sales or subscriptions, we have thank you. You know who you are." To help out, visit http://HerpArts.com or send a check to *HerpDigest*, c/o Allen Salzberg, 67-87 Booth Street, 5B, Forest Hills, NY 11375.

Hungry lizards invade Sanibel

Lock up the small dogs, cats and children. The city manager of Sanibel on Florida's Gulf Coast reports that Nile Monitors have invaded. The *Miami Herald* [September 26, 2005] reports: "[The lizard] . . . arrived furtively, almost certainly by sea. Tucking scaly little arms into its slender body, it propelled itself with its ridged tail, a well-muscled rudder, through the waters from neighboring Cape Coral or Pine Island, biologists believe. And here it now is, just as officials feared, a carnivorous, dagger-clawed, razor-toothed African monitor lizard that knows no Florida predators, running amok in a fragile nature preserve filled with nestlings and delectable bird and turtle eggs. `We did consider offering a reward, but we didn't want people to bring them from elsewhere,' said . . . [the] city manager for Sanibel (on the southwest Gulf Coast), which posted the lizard's mug on its website and cautioned that no `infant humans' be left alone. `We're very concerned, yes.'" [from Allen Salzberg, *HerpDigest* #5/79, October 5, 2005]

Weird enough?

I sometimes wonder what my contributors think of me. Marybeth Trilling also forwarded this note from a German herpetologist, commenting that "it's weird enough for your column." A woman died of snakebite in the Sundarbans region which spans India and Bangladesh in the Bay of Bengal. What made the situation come to the attention of westerners was that her neighbors took her to a voodoo practitioner first. Only after her condition got worse was she taken to the local Christian Missionary Hospital where she died. The villagers blamed western medicine, not the delay to treatment. They credit native healers with a high success rate which is probably more a function of the number of dry bites than any particular ability to deal with snake toxin.

More Coqui-tales

- "Hydrated lime improperly administered to fight coqui frogs poses a serious potential human health risk and the state is hearing . . . several reports about residents not following the directions on the labels of hydrated lime when using it as a pesticide. Instead, some people are applying just the dust." [*West Hawaii Today*, May 28, 2005, from Paul Breese]

- "Costly coqui frogs affecting state economy. Frogs disrupt real estate deals, nurseries. . . . " scream the headlines. Eradicating coqui frogs costs an arm and a leg because the "Oahu Invasive Species Committee sprays at least four nights a week amid fears the rapidly multiplying coqui could easily spread if they aren't completely eradicated." [*West Hawaii Today*, July 11, 2005, from Paul Breese]

- "A tiny, 2-inch frog is causing a big stir in Hawaii. Beloved in its native Puerto Rico, the coqui frog has become a menace . . . where it suddenly appeared in the 1990s. With no natural predators . . . the frogs and their loud `ko-KEE' mating calls have multiplied exponentially—causing headaches for homeowners." [Arkansas *Democrat-Gazette*, July 16, 2005, from Bill Burnett]

- Recent studies show that coqui frogs (*Eleutherodactylus coqui*) "don't inhabit the same high-elevation areas as endangered Hawaiian birds, meaning there is little fear the invasive amphibians will compete with the birds for food and push them into extinction." [*West Hawaii Today*, August 29, 2005, from Paul Breese; USA Today, August 30, 2005, from Bill Burnett]

Count Frog-ula?

"I would like to contact herpetologists involved in size-assessment of amphibian populations of species that are of commercial interest. For example, in the U.S. specimens of

the Bullfrog, *Rana catesbeiana*, are harvested in order to obtain the legs, which are sold on the commercial market for consumption in restaurants . . . because, in the Danube Delta of Romania, there have been requests submitted by various commercial firms for a license for frog-leg exploitation. Before issuing a permit to them, we feel we must establish a quota for existing frog populations, which might then put limits on the number to be harvested for the commercial market. To set a quota, we are trying to find out any research details or results that focused both on assessments of numbers of frogs in a given population and on establishment of numbers of frogs that might be removed from said population without long term damage to the a species. Anyone involved in such research and willing to provide reprints or research results, please contact me at: Zsolt Török, Danube Delta National Institute, 165 Babadag Street, Tulcea 820112, Tulcea County, Romania. Fax (+ 04) 0240 533547. Email: torok@indd.tim.ro" [from Jim Harding, October 4, 2005]

Toxic frog legs

Super contributor Marybeth Trilling wrote: "This article made me very unhoppy. Good that there is something being done." The story reports that the wildlife department of the western Indian state of Goa, ran a campaign "this monsoon to save the frog—traditionally poached from flooded paddy fields for frog legs." The department's poster, "Save the Frogs," warned that monsoonal frog poaching was an "ecological crime against the food chain, affecting the ecological balance of terrestrial and aquatic ecosystems," according to *Asian Age*, July 14, 2005. Poached frogs feed not only the people who catch them, but are sold to restaurants and some probably end up exported. The article continues, "Frogs though perform a vital function, reducing insect population and preventing insect borne diseases like malaria, the incidence of which has risen in recent years. In a bid to reduce demand itself, the administration issues annual warning notices that sustained consumption of frog legs—whose fat contains ` toxic residues from chemical fertilizers' —increases risk of cancers, strokes and kidney failure. Villagers though comment that there has been an audible decline in frog population, and fields that once resounded with frog night calls are less noisy after the first few rains. The use of chemical fertilizers is attributed as one major cause, along with poaching, which though reduced still continues in pockets. . . . [A] wildlife enthusiast . . . rescued some fifty frogs from seven poachers one night registering the first police complaint for frog poaching under the 1972 Wildlife Act, which makes it an offense."

Frogs may save us yet

"A judge this week struck a blow to Bush administration efforts to simplify the federal approval of pesticides, saying that the Environmental Protection Agency must consider whether pesticides will harm the red-legged frog before approving those pesticides for use . . . [and] ordered the EPA to consult with U.S. Fish and Wildlife Service biologists on whether dozens of different pesticides are harmful to the frog. . . . A rule change in July 2004 allowed the EPA to approve pesticides without consulting with federal wildlife agencies. . . . Although this week's ruling applies only to the frog, it sets a regional legal precedent that would apply to any of the hundreds of endangered species of plants and animals in California. The red-legged frog, a native to the Mother Lode and other parts of California, is believed to be the frog featured in Mark Twain's story ` The Celebrated Jumping Frog of Calaveras County.' . . . No red-legged frog had been seen in Calaveras County for 34 years until 2003 when a rancher's children found a few of them. Last year, a study . . . found that frog populations across the state had declined the most in areas with the highest exposure to farm pesticides over the 17 years from 1974 to 1991. . . . Prevailing Central Valley winds spread air pollution east into the foothills and Sierra Nevada." This ruling has implications in human health, too. "The EPA has been approving pesticides based on each chemical's individual effects. No study is done of what happens when a bunch of different chemicals combine," and no one can predict what will happen when different pesticides combine and meet up in ditches, streams, lakes and rivers. [*Sacramento Record*, September 21, 2005, from Ken Mierzwa]

Can it be done?

The BBC reports that "saving the world's frogs, toads and salamanders from oblivion will top $400 million over five years . . . the estimated cost of a global action plan drawn up during an expert summit in Washington, D.C., and backed by the UN's biodiversity agency IUCN. The money would pay for the protection of habitats, for disease prevention and captive-breeding projects, and for the ability to respond to emergencies. About a third of all amphibian species are at a high risk of extinction. . . . [The] deputy chair of IUCN's species survival commission, told the BBC News website, ` The extent of these declines and extinctions is without precedent in any class of animals over the last few millennia.' According to the Global Amphibian Assessment, a vast and authoritative study which reported its findings last year, almost a third of the 5,743 known species are at risk of extinction; up to 122 have disappeared within the last 25 years . . . [due to] habitat loss and degradation, climate change, chemical contamination, infectious disease, notably the fungal infection chytridiomycosis, invasive species, [and] over-harvesting. . . . The action plan sees captive breeding as a bridge to a better era when chytridiomycosis can be beaten and the amphibians returned to the wild. [However, one group points out,] ` we've been running a captive-breeding program with the boreal toad (*Bufo boreas*) since 1995. . . . ` We've tried re-introducing them to the wild seven or eight times, but every time they die within a couple of years; if you don't get rid of the fungus, all you're doing is providing it with lunch.'" [September 19, 2005, from all the usual suspects including Jim Harding, Ken Mierzwa, Bill Burnett, Ray Boldt, Alan Rigerman. And if I haven't found it in the pile, I'm sure there's three more copies down there, or on the way.]

It's real, not a legend

Email this morning was full of copies of a rather disgusting photo and the question, "Is it real or Photoshop?" The photo is of a python, half of which is stretched wide over the top half of a six-foot alligator, while the other end floats, bloated and decomposed in the water. The tail of the gator is sticking out

of the middle of the python. I'm sure it'll make the rounds to an email box near you. Ever mindful of hoaxes in this job, I got in touch with Dr. Frank Mazzotti's office at University of Florida whose helpful coworker Michelle Casler wrote: "It is, in fact, a true story. I personally received several photos that were sent out by the photographer that took them in the Everglades National Park before it was covered by the Associated Press." One of my contributors suggested "What these two giant reptiles should be doing is uniting against the sugar growers," not eating each other. [From Wes von Papineau, Karen Furnweger, Allen Salzberg, the local newspaper and about a zillion clippings still in the mail]

Check your deodorant around him!
Michael Tyler's team from University of Adelaide has been awarded a 2005 Ig Nobel Prize honoring "achievements that first make people laugh, and then make them think." Tyler's team discovered that frogs smell differently when they are happy or stressed. Compounds derived from this research are used to repel pigeons on high rises and work continues on unraveling other froggie fumes. [ABC Science Online, October 7, 2005]

Rare frogs found again in their natural habitat
A biologist found a mountain yellow-legged frog in the hills above San Bernardino, surprising everyone because the last known eleven frogs had been taken to Los Angeles Zoo after catastrophic wildfires created landslide and flooding risk. So where did this one, and the two more they rustled up on a return trip, come from? Tissue samples may reveal how closely related they are to those in the Zoo. "Most amazing is the change in habitat in two years. It appears the floods can take away habitat and restore it. . . . The discovery comes just as the federal government last week proposed designating 8,283 acres in San Bernardino, Riverside and Los Angeles counties as critical habitat for the frog." [*Inland Valley Daily Bulletin*, September 22, 2005, from Aiken Reed, II]

ESA Endangered
On September 29, 2005, the "Threatened and Endangered Species Recovery Act of 2005," H.R. 3824, passed the House of Representatives: 229 to 193. Of those in favor, 193 were Republicans, 36 Democrats. On the other side, 158 Democrats opposed the bill joined by 34 Republicans and one Independent. Not present were four Republicans and eight Democrats. The Senate will consider the bill in early 2006. [Multiple sources: September 29, 2005]

Routine news days

- "Two people were arrested . . . on suspicion of releasing an alligator in a small city lake [in Los Angeles], where the reptile has evaded capture while drawing many spectators. . . . Officers also seized other alligators, turtles and snakes [in the suspects' home]." A crew from a central Florida attraction offered to "take the gator back with them if the city doesn't want to keep it." [Orlando Florida *Sentinel*, August 25, 2005, from Bill Burnett]

- "State agriculture officials say a Honolulu family captured an illegal lizard after a son spied the two-foot long reptile on a wall in the driveway of the family's . . . home. The green-colored lizard was identified as a Solomon Island Prehensile-tailed Skink." The family caught the lizard before calling authorities who assume it's an escaped pet. [*West Hawaii Today*, July 6, 2005, from Paul Breese]

Massasaugas online
Charlotte Cox of Metro Toronto Zoo writes: "Fellow rattlesnake enthusiasts, just a quick note to let you know that the Fall/Winter 2005 issue of *Rattlesnake Tales* has been completed, and is now available online at http://www.massasauga.ca. Please note that the document is in PDF format, so you will need Adobe Reader to open the newsletter. [September 29, 2005]

Science is applied laziness
The *New Zealand Times*, October 6, 2005 reports: "[A] 13-year-old [boy] made a leap forward for frog-kind with his award-winning invention which keeps these little guys alive in urban areas. The Howick College student swatted three awards at this year's HiTech Bright Spark competition with his solar and micro-processor powered frog home, Frog Paradise. ` In the day it's hooked up to a solar panel which powers a pump that keeps the water fresh and oxygenated,' he says. ` The panel also powers a car battery, so at night it switches on a bright spotlight LED and two flashing LEDs which attract insects. Frogs live around damp areas so my unit makes it possible for them to live in urban areas." The young scientist flew to Christchurch last week to receive the best junior project supreme award, best biotechnology circuit and best original circuit in the nationwide competition. . . . The inspiration came from his brother who studies biology at Auckland University. ` He was quite interested in frogs so he bought some, but he didn't take care of them. So I decided to create a unit to take care of them without me having to do anything. If I could make it easier for people to keep frogs as pets and hopefully the frog population would grow.' The unit took a month to make—two weeks for research followed by two weeks of design and construction."

A dose of reality
"The red-eared slider story ` Spanish Fish Live In Fear Of Predator Turtles' . . . is hysterically funny. Old timers (sorry!) like us, have lived with this species for a hell of long time—we know them well. I've never seen one catch a fish on the fly—they can't. They can only do it when starved to the brink of death, in a too-small container and given no choice but die or corner that goldfish who usually is on its last legs or fins anyway. In South Florida where I live . . . red ears, their congeners and hybrids are all over the place. Some like *T. terrapene* make the redear look like a sissy. I can go out and catch an assortment of *Trachemys* on a halfway decent day. To call these scavengers ` predators,' is . . . tantamount to calling the non-native Bahamian *Anolis* ` New World Komodo Dragons.' Someone has to stick up for this red, white and blue chelonian. OK, it doesn't belong there . . . or in Indonesia, Turkey, Taiwan, California . . . , my backyard, and who knows where else. Only the Spanish have an ecological disaster? [If they

were such fish eating predators, he wonders,] why don't [*Trachemys* turtles] kill carp in Tennessee where there are a trillion of 'em? I think they (the Spanish ` experts') . . . have caught on. . . . One can get grants for yelling ` fire' in a crowded theater when it comes to misplaced flora and fauna. Still laughing, Marc Weiss. P.S.: this isn't directed at you for reporting the news. This one really cracked me up. They pollute their water; the fish die, the turtles can take the pain and eat the dead fish and take the spotlight off the real cause. Sounds like Monroe County down here. ` The Keys,' to you Yankees." [The original story was in *HerpDigest* # 5/5; this letter in #5/76, September 23, 2005]

New books this month include:

• *Texas Snakes: A Field Guide* (paperback version) by James R. Dixon and the late John E. Werler with drawings by Regina Levoy. The press release from The Center for North American Herpetology, Lawrence, Kansas, reads: "From the legendary Western Diamondback Rattlesnake to the brightly-colored Texas Coral Snake to the harmless New Mexico Blind Snake, Texas has a greater diversity of snake species than any other state in the country. Recognizing the need for a complete field guide to identifying and understanding the snakes of Texas, two of the state's most respected herpetologists wrote this definitive reference to all species of Texas snakes." [September 22, 2005, from Jim Harding]

• *Venomous Snakes of the World* by Mark O'Shea will be out by the time you get this issue. It's a 160-page hardcover from Princeton University Press, companion piece to Mark's *Lizards* of two years ago.

• *Frogs: Inside Their Remarkable World* by Ellin Beltz, 175 pages of glorious color photographs of frogs sitting, eating, sleeping, mating (lots of those), estivating, burrowing, calling, and just hanging out accompanying scientifically accurate text accessible to readers of all ages (according to *Science News*, September 20, 2005). As the publisher says it's available at better book-dealers everywhere. If your store doesn't have one, ask for it by ISBN 1552978699. The CHS is listed in the author's biography for all the obvious reasons. *Humboldt Beacon* writer Emma Breacain read the whole book and did a great story on it, and me, in their October 6, 2005, issue. She wrote, "Exhaustively researched, thoughtfully organized and exploding with exquisite color photos, ` Frogs' may be candy for the eye and food for the brain. And when you're done reading it, you may find it too pretty to put on a shelf. . . . Beltz starts off with frogs' place in human culture and history, then launches into the astounding array of different families and species of frogs, then breaks out chapters on anatomy and physiology and frog's precarious place in our quickly changing (i.e., polluted) Earth environment. It's all here." I told her about my earliest introduction to frogs and added "It was one of the most important days of my life. . . . It was a day when the plastic, artificial world I lived in fell away. I looked into this frog's eyes. This was something that wasn't made in a machine. This wasn't under human control. This was my first inkling of something beyond the concrete and skyscrapers. At that point, who cares how much trouble I got into [for getting dirty that day]?" She also captured my artist's statement for Frogs, "I'm so tired of boring reference books. It think they turn our kids off. Why not write everything we know in language we can understand? Some of my colleagues might accuse me of dummying down, but I'd rather have a book that everyone can read." I hoping you all want to read it!

Thanks to everyone who contributed to this issue and to Paula Shevick, Ms. G. E. Chow, Alan Rigerman, Bill Burnett, Garrett Kazmierski, John Christianson, Marty Marcus, Teri Radke, Eloise Mason and everyone else kind enough to clip out whole pages of newspapers or magazines and send to: Ellin Beltz, POB 1125, Ferndale, CA 95536. Email: ebeltz@ebeltz.net.

Herpetology 2005

In this column the editorial staff presents short abstracts of herpetological articles we have found of interest. This is not an attempt to summarize all of the research papers being published; it is an attempt to increase the reader's awareness of what herpetologists have been doing and publishing. The editor assumes full responsibility for any errors or misleading statements.

BONE GROWTH IN VARANIDS

V. de Buffrénil et al. [J. Herpetology 39(2):328–335] report that radiographic and histologic examination of long bone epiphyses in 25 species of Varanoidea (including one *Heloderma* species) reveals a qualitative difference in epiphyseal development between small and large species. In small monitor lizards, most of them belonging to the subgenus *Odatria*, metaphyseal plates tend to disappear completely, with fusion of primary and secondary epiphyseal ossification centers in adults that reach an individual body length close to the maximum known for their species. Epiphyseal fusion results in a complete and irreversible arrest of growth. This observation falsifies the previously accepted conclusion that the monitor lizards as a whole have a continuous growth. Conversely, in larger species, morphologically complete growth plates remain present in most (but not all) specimens, including very large adults. Although this feature is not firm evidence of a continuous growth, it nevertheless suggests that large species maintain active growth during ontogeny over a longer period than small species.

SALMONELLA SUPPRESSION

M. A. Mitchell et al. [2005, J. Herpetological Medicine and Surgery 15(2):9-14] note that although attempts to eliminate *Salmonella* spp. in chelonians using antibiotics have been made, they have not been successful in reducing prevalence to levels that would reverse current regulations. Baquacil® is a commercial algistat and microbicide. Fifty-five red-eared slider turtles, *Trachemys scripta elegans*, were used to evaluate the efficacy of Baquacil® as a method to suppress *Salmonella* sp. in the sliders' habitat. The sliders were maintained individually in plastic containers that contained either chlorinated tap water, dechlorinated tap water and 25 ppm Baquacil®, or dechlorinated tap water and 50 ppm Baquacil®. Water samples were collected from each slider container three times per week for one month and cultured for *Salmonella* sp. Water samples collected from the sliders housed in Baquacil® were less likely to be *Salmonella*-positive than those in the control group ($p < 0.001$). There was no difference in the *Salmonella* status of the water samples between the 25 and 50 ppm treatment groups. At the conclusion of the study, the intestinal tracts of the sliders were cultured for *Salmonella* sp. There was no difference in the *Salmonella* status of the intestinal cultures collected from any of the sliders at necropsy ($p = 0.8$). No pathological lesions were found to be associated with swimming the sliders in 50 ppm Baquacil® for one month. Baquacil® may be used to suppress *Salmonella* sp. in the water column of sliders.

FENCE LIZARD COLORATION

R. M. Cox et al. [2005, Copeia 2005(3):597-608] note that adult male eastern fence lizards (*Sceloporus undulatus*) possess blue and black ventral patches that function in sex recognition and intrasexual social signaling, but this ventral coloration is absent or greatly reduced in females and juvenile males. Adult males also exhibit a relatively uniform, reddish brown dorsal coloration, while females and juvenile males are cryptically colored, with two rows of dark brown or black chevrons set against a background of gray and brown. The authors show that sexual divergence in ventral coloration is temporally correlated with sexual divergence in plasma testosterone in free-living juvenile males and females, supporting the hypothesis that sexual dichromatism is regulated at least in part by testosterone. This hypothesis was experimentally tested by (1) removing the primary source of circulating testosterone in juvenile males via surgical castration, (2) restoring testosterone in castrated males with tonic-release implants, and (3) implanting intact juvenile females with exogenous testosterone. As predicted by the hypothesis, the development of blue and black ventral coloration in *S. undulatus* was (1) inhibited by castration in juvenile males, (2) restored by exogenous testosterone following castration in juvenile males, and (3) promoted by exogenous testosterone in juvenile females. The expression of male-specific dorsal coloration was also (1) inhibited by castration and (2) restored by exogenous testosterone following castration in juvenile males. Results are consistent with established literature supporting the critical role of androgens in the mediation of sexually dimorphic coloration among phrynosomatid lizards.

EXPOSURE OF WILD BOAS TO IBD

B. A. Lock and E. R. Jacobson [2005, J. Herpetological Medicine and Surgery 15(2):4-8] used enzyme-linked immunosorbent assay (ELISA) to evaluate 58 plasma samples, collected in the wild from Brazilian boa constrictors, *Boa constrictor*, for exposure to a retrovirus isolate obtained from captive boa constrictors with inclusion body disease (IBD). Monoclonal antibodies (HL 1785 and HL 1787) specific for boa immunoglobulin (IgG) were used to detect binding of boa IgG to the retroviral isolate. Mean optical density (OD_{405}) at a 1:1250 dilution of boa plasma was 0.161 (range 0.110 – 0.258 [standard deviation 0.034]) for HL 1785 and 0.170 (0.134 – 0.266 [0.023]) for HL 1787. The values from this study can be used as baseline reference range for future comparison to known IBD positive snakes and the eventual establishment of a group of naive boas to be used in transmission studies, needed to establish a causal relationship between previously isolated retroviruses and IBD.

Unofficial Minutes of the CHS Board Meeting, September 16, 2005

Vice-president Zorina Banas called the meeting to order at 7:30 P.M. Board members Jim Hoffman, Linda Malawy, Steve Sullivan and Jenny Vollman were absent.

Officers' Reports

Recording Secretary: Melanie Aspan read the minutes of the August 19 board meeting. The minutes were accepted as read.

Treasurer: Zorina Banas distributed the August financial statements in Jim Hoffman's absence.

Membership Secretary: Jennifer Spitzer reported a current member count of 604 — the same as last month.

Corresponding Secretary: Deb Krohn announced that she had been contacted by one of the pet store chains which was looking for a contact to offer herp advice to prospective customers. She had also received a request from a Chicago school for a presentation on the proper care of box turtles to be presented to their pet club.

Publications Secretary: Mike Dloogatch reported that the exchange publications have been successfully moved from Gary Fogel's home to his own home.

Sergeant-at-Arms: Ron Humbert reported 64 attendees at the August general meeting.

Committee Reports

Shows: Mike Dloogatch offered further details on the show at the Chicago Cultural Center on October 29, 10 A.M. – 3 P.M. We will be reimbursed for parking for three vehicles. Mike, Linda and Steve are planning on attending. Any other interested parties should contact Mike.

Library: Steve Sullivan plans to offer some duplicate books for sale at this year's December meeting. The plaque for the library cart remains in production.

Adoptions: In response to a request from Linda Malawy, Mike Dloogatch moved that the CHS reimburse Linda and Bob Bavirsha for their motel rooms in Mount Vernon from the Adoptions fund. Ron Humbert seconded the motion and it was passed unanimously.

General Meetings: October's Herp of the month will feature herps with orange and/or black in their color schemes. There will be no Herp of the Month during the November election meeting, but December will feature "novelty" herps in order to encourage entries during the colder months.

Nominating Committee: Bob Bavirsha reported for the committee that this year's slate will be presented at the September general meeting. The committee will utilize the CHS website to post an absentee ballot which will be even more up-to-date than the copy contained in the *Bulletin*. Bob has also offered to bring animals and make a presentation at November's election meeting this year.

Chicago Wilderness: It was mentioned that Sunday, September 18, is Chicago Wilderness's yearly Networking Day at Brookfield Zoo.

Ideas and Suggestions

Bob Bavirsha suggested that expiring memberships could be published in the *Bulletin* in order to remind these members to renew in lieu of the postcard which is currently being sent.

Linda Malawy has suggested that the Board produce a binder/scrapbook depicting the benefits of membership and featuring pictures of shows, trips etc. which would be present at meetings and shows to encourage new attendees to begin a membership. Deb Krohn volunteered to work on this project.

Deb would like to thank everyone who assisted with the trip to Big Sand Mounds and will submit a write-up to Mike for the *Bulletin*.

Mike Dloogatch gave the telephone number (312) 409-4456 as the new voice-mail number which should be given out and should begin to replace the number on all our literature.

Roundtable

Mike Dloogatch handed around the September edition of the Notebaert Museum's monthly newsletter which mentions the CHS twice.

The meeting was adjourned at 9:39 P.M.

Respectfully submitted by Melanie Aspan, Recording Secretary.

Advertisements

For sale: rats and mice—pinkies, fuzzies and adults. Quantity discounts. Please send a SASE for pricelist or call Bill Brant, *THE GOURMET RODENT*, 6115 SW 137th Avenue, Archer FL 32618, (352) 495-9024, E-mail: GrmtRodent@aol.com.

For sale: from **The Mouse Factory**, producing superior quality, frozen feeder mice and rats. We feed our colony a nutrtionally balanced diet of rodent chow, formulated especially for us, and four types of natural whole grains and seeds. Mice starting from: pinks, $.17 each; fuzzies, $.24 each; hoppers, $.30 each; weanling, $.42; adult, $.48. Rats: starting with pinks at $.45 each, to XL at $1.80 each. Discount prices available. We accept Visa, MC, Discover or money orders. PO Box 85, Alpine TX 79831. Call **toll-free** at (800) 720-0076 or visit our website: < http://www.themousefactory.com> .

For sale: **high quality frozen feeders**. Over a decade of production and supply. Seven sizes of mice availabe: small newborn pinks up to jumbo adults. Prices start at $25 per 100. Feeders are separate in the resealable bag, not frozen together. Low shipping rates. Free price list. Kelly Haller, 4236 SE 25th Street, Topeka KS 66605, (913) 234-3358 evenings and weekends.

For sale: books. *Boy's Book of Snakes* by Percy Morris, 1948, many b&w photos, some ink marks on page one of intro, otherwise very good condition, deals with both U.S. and foreign species, contains very elementary husbandry info, hardbound, $20; *Poisonous Snakes of the World* by the Department of the Navy, revised edition, 1965, revised by a committee consisting of Herndon Dowling, Sherman Minton, Jr., and Findlay Russell, 212 pp., 120 figs. (b&w photos, drawings), 8 color plates, 15 tables, list of antivenin sources, hardbound, $15; *The Reptiles* by Archie Carr, 1963, 192 pp., many color and b&w photos, drawings, an interesting, well-written book by this noted herpetologist, hardbound, $9; *Dragon Lizards & Goannas of South Australia* by T. F. Houston, 1978, 84 pp., 30 figs. (range maps, drawings), 12 plates (some in color), softbound, $28; *The Bronx Zoo Book of Wild Animals* by William Bridges, 1968, 304 pp., 252 color and b&w photos, 39 pp. on reptiles and amphibians, DJ, hardbound, $22. All books in excellent condition except as noted. $2.50 postage and handling for orders under $25, free for $25 and over. William R. Turner, 7395 S Downing Circle W, Littleton, CO 80122, (303) 795-5128, e-mail: toursbyturner@aol.com.

For sale: c.b. blue-tongued skinks, *Tiliqua scincoides*, born August 2004, $70 each. Linda Malawy, (630) 717-9955.

For sale: c.b. '03 yellow anacondas, aggressive feeders, perfect health, about 2' long, $100 each; also c.b. '04 reticulated pythons; beautiful hatchlings already feeding on adult mice. These guys are tiger siblings and are available for $100/each as well. Personal checks, money orders and Paypal accepted. Out of state shipping available. If you have questions or would like to purchase an animal call Mark Petros, (847) 836-9426 or E-mail ballpython777@yahoo.com.

Herp Tours: Why pay more? Travel with the International Fauna Society, a 501 (c)3 not-for-profit organization, and experience the Costa Rican rainforest! Stay at the beautiful Esquinas Rainforest Lodge in the untouched herpetological paradise that is Piedras Blancas National Park. Meet new friends, relax in the naturally-filtered swimming pool or in the lush, fauna-filled tropical garden. Discounts for IFS and Chicago Herp Society members. For details, visit The International Fauna Society website at www.faunasociety.org or E-mail: info@faunasociety.org.

Herp tours: Adventure trips to **Madagascar**! Journey somewhere truly unique to seek and photograph nature on the world's least-studied mini-continent. For maximum herp fun and discovery, join Bill Love as we go where few people will ever venture in their lives. Let his experience assure a comfortable tour finding the most colorful and bizarre species on the planet! Get all the details at Blue Chameleon Ventures' comprehensive new website: < http:// www.bluechameleon.org> , E-mail: bill@bluechameleon.org, or call (239) 728-2390.

Herp tours: The beautiful Amazon! Costa Rica from Atlantic to Pacific! Esquinas Rainforest Lodge, the Osa Peninsula, Santa Rosa National Park, and a host of other great places to find herps and relax. Remember, you get what you pay for, so go with the best! GreenTracks, Inc. offers the finest from wildlife tours to adventure travel, led by internationally acclaimed herpers and naturalists. Visit our website < http://www.greentracks.com> or call (800) 892-1035, e-mail: info@greentracks.com

Virtual Museum of Natural History at www.curator.org: Free quality information on animals—emphasis on herps—plus expedition reports, book reviews and links to solid information. Always open, always free.

Wanted: Volunteer to help with midwestfrogs.com web site by transcribing videotaped interviews with frog biologists (from VHS). Dave McGowan, dmcgowan3@earthlink.net.

Wanted: Female ball pythons, adults preferred but smaller animals also considered. I am a professional breeder specializing in ball pythons and I can assure you that your animal will be provided with excellent care and optimal living conditions. Mark Petros, (847) 836-9426; ballpython777@yahoo.com.

Wanted: I'm looking for my soulmate. I want to settle down to a family before it is too late. But I have this problem. . . . When we get into hobbies and interests: old popular records, jazz and show tunes, and antique electronics are fine, but when I mention turtles, "What, are you crazy?" So maybe this is a better place to look. Please don't try to separate me from my turtles—at least not most of them. If interested, please drop a line to Ellis Jones, 1000 Dell, Northbrook IL 60062, telling a bit about yourself and giving a phone number.

Line ads in this publication are run free for CHS members—$2 per line for nonmembers. Any ad may be refused at the discretion of the Editor. Submit ads to: Michael Dloogatch, 6048 N. Lawndale Avenue, Chicago IL 60659, (773) 588-0728 evening telephone, (312) 782-2868 fax, E-mail: MADadder0@aol.com.

Statement of Ownership, Management and Circulation

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16. Publication of Statement of Ownership
Required. Will appear in the October 2005 issue of this publication.

17. Signature of Editor Michael Dloogatch

News and Announcements

2006 CHS HERPETOLOGICAL GRANTS PROGRAM

The Chicago Herpetological Society announces the 2006 CHS Herpetological Grants Program to award financial support for herpetological research, education and conservation. Several awards of up to $500 each will be available. Interested parties may apply for a grant in any one of the following categories:

1. Illinois Herpetology
2. Graduate Student Research in Herpetology
3. Undergraduate Research in Herpetology
4. Conservation
5. Captive Management, Husbandry, and Propagation

An attempt will be made to award grants in each category, but depending on the applications received, not all categories may receive awards. Some categories may receive more than one award. The CHS Grants Committee reserves the right to reassign the category under which a given proposal is submitted.

To qualify for a grant, the applicant must be a member of the Chicago Herpetological Society as of December 31, 2005. In accepting a grant, the recipient agrees to abide by all state and federal laws, and to acknowledge the Chicago Herpetological Society in any publications or public presentations (e.g., posters, papers at symposia, etc.) that result from the subsidized research. Recipients should inform the CHS Grants Committee when their funded projects are completed, and will be encouraged to submit their work as an article for the CHS *Bulletin*, or will be invited to present a program at a CHS general meeting.

Proposals should include the following:

1. Statement of the objectives of the proposal, and a statement assigning the proposal to one of the five categories listed above.
2. Description of materials and methods.
3. Complete budget, not to exceed $500.
4. Brief résumé of the applicant, if an individual. If the applicant is an organization, background information on that organization should be included.
5. Letters of support from collaborating partners or institutions are encouraged; student applicants must include a letter of support from a faculty adviser (see further instruction below).
6. Anticipated completion date for the project.

Proposals may be submitted either by postal mail at the address below or as E-mail attachments. Letter(s) of support sent by postal mail should be included with the other application materials but in a separate, smaller sealed envelope. Letters of support may be E-mailed, but then should include a postal address and phone number at which the writer can be contacted. Proposals must include the applicant's name and address on the first page. Proposals should be typed using a common font (e.g., Arial, Times, Courier) no smaller than 10pt, and should be double-spaced. When submitting proposals by mail, send two copies of the entire package (i.e., including résumé, budget, letters of support, etc.) in the same envelope. Applications should be brief and simple. Avoid inclusion of color images or large tables unless absolutely necessary. Complete proposal packages should not exceed five double-spaced pages (excluding literature citations, applicant's résumé and letter[s] of support). Applications must be received by 31 December 2005, and awards will be announced by 15 February 2006.

Submit paper applications to:

Chicago Herpetological Society
Grants Program
2430 North Cannon Drive
Chicago IL 60614

Electronic submissions should be E-mailed to: CHSGrant@aol.com.

Questions should be directed to Michael Dloogatch, (773) 588-0728, or CHSGrant@aol.com.

UPCOMING MEETINGS

The next meeting of the Chicago Herpetological Society will be held at 7:30 P.M., Wednesday, October 26, at the Peggy Notebaert Nature Museum, Cannon Drive and Fullerton Parkway, in Chicago. **Tom Johnson**, author of *The Amphibians and Reptiles of Missouri* and former State Herpetologist for Missouri, will present a slide program entitled "My Top Ten Favorite Missouri Herps."

The November 30 meeting will include the annual election of officers and members-at-large of the CHS Board of Directors. Also at this meeting **Bob Bavirsha** will bring some impressive live animals from his collection and speak to us about them.

The regular monthly meetings of the Chicago Herpetological Society take place at Chicago's newest museum — the **Peggy Notebaert Nature Museum**. This beautiful new building is at Fullerton Parkway and Cannon Drive, directly across Fullerton from the Lincoln Park Zoo. Meetings are held the last Wednesday of each month, from 7:30 P.M. through 9:30 P.M. Parking is free on Cannon Drive. A plethora of CTA buses stop nearby.

Board of Directors Meeting

Are you interested in how the decisions are made that determine how the Chicago Herpetological Society runs? And would you like to have input into those decisions? If so, mark your calendar for the November 18 board meeting, to be held at the North Park Village Administration Building, 5801 North Pulaski Road, Chicago. To get there take the Edens Expressway, I-94, and exit at Peterson eastbound. Go a mile east to Pulaski, turn right and go south to the first traffic light. Turn left at the light into the North Park Village complex. At the entrance is a stop sign and a guardhouse. When you come to a second stop sign, the administration building is the large building ahead and to your left. There is a free parking lot to the left and behind the building.

The Chicago Turtle Club

The monthly meetings of the Chicago Turtle Club are informal; questions, children and animals are welcome. Meetings normally take place at the North Park Village Nature Center, 5801 N. Pulaski, in Chicago. Parking is free. For more info call Lisa Koester, (773) 508-0034, or visit the CTC website: http://www.geocities.com/~chicagoturtle.

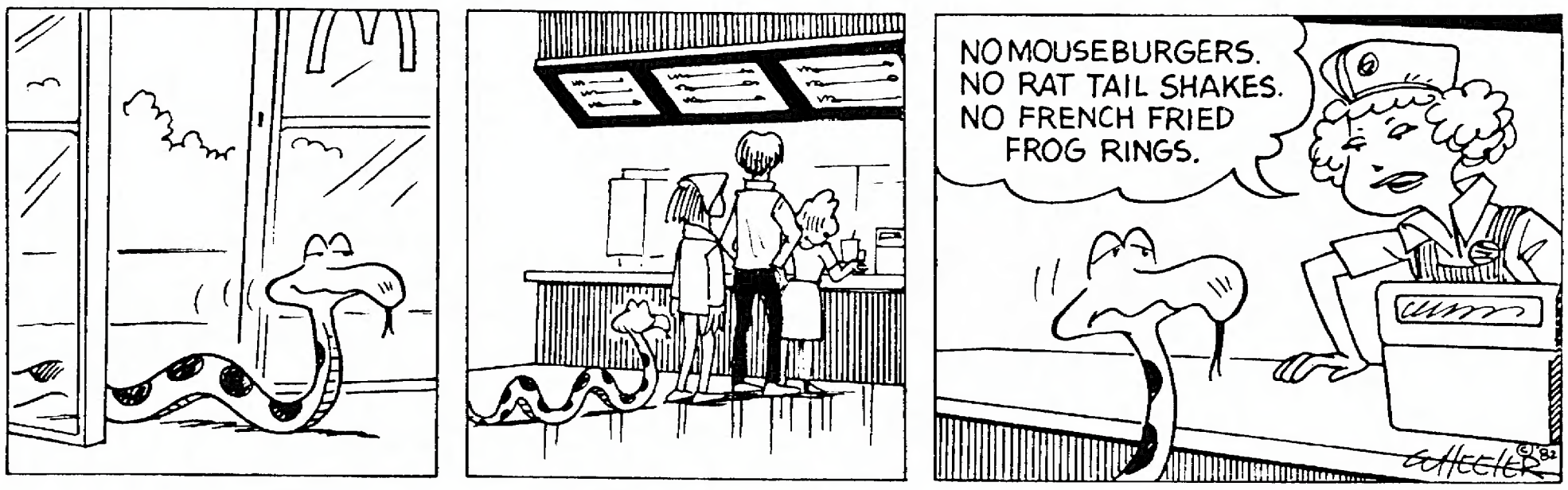
CHS LIBRARY

Take advantage of your membership benefits by checking out a book from the CHS lending library. We've got something on just about every aspect of herping and get new books all the time. Our library receives donations on a regular basis. This means that we have multiple copies of some great books. At the October and November meetings we will be selling some of our duplicate stock at substantial discounts. Get a few great herp books at the next meeting—just in time for Christmas!

HERP OF THE MONTH

Each monthly meeting will showcase a different herp. CHS members are urged to bring one specimen of the "Herp of the Month" to be judged against the entries from other CHS members. Prizes will be awarded to the top three winners as follows: 1st place—6 raffle tickets at next meeting; 2nd place—4 raffle tickets at next meeting; 3rd place—2 raffle tickets at next meeting. For the October contest bring any herp with orange and/or black colors.

THE ADVENTURES OF SPOT



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